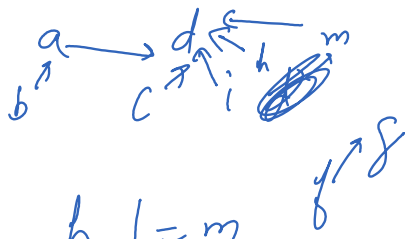
Monday, June 27, 2022 8:53 PM



$a == b$

$c == d$

$d == i$

$f == g$

$h == i$

$b == i$

$h != m$

$a == m$

$a == b$ ✓

$c == d$ ✓

$b == c$ ✓

$f == g$ ✓

$h == i$ ✓

$g == i$ ✓

$m == n$ ✓

$o == p$ ✓

$q == r$ ✓

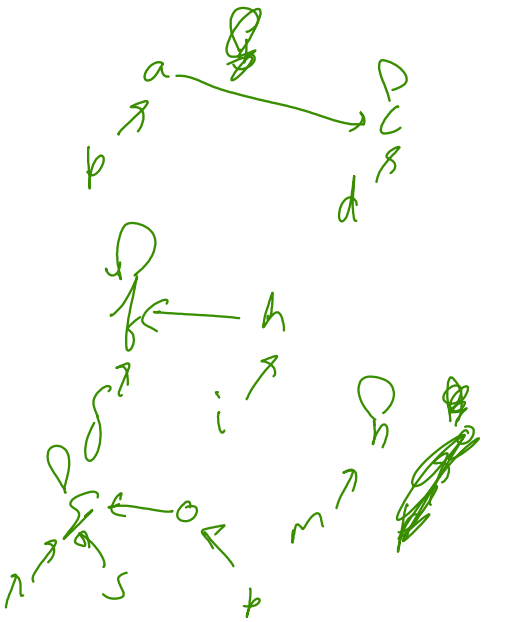
$r == s$ ✓

$s == p$ ✓

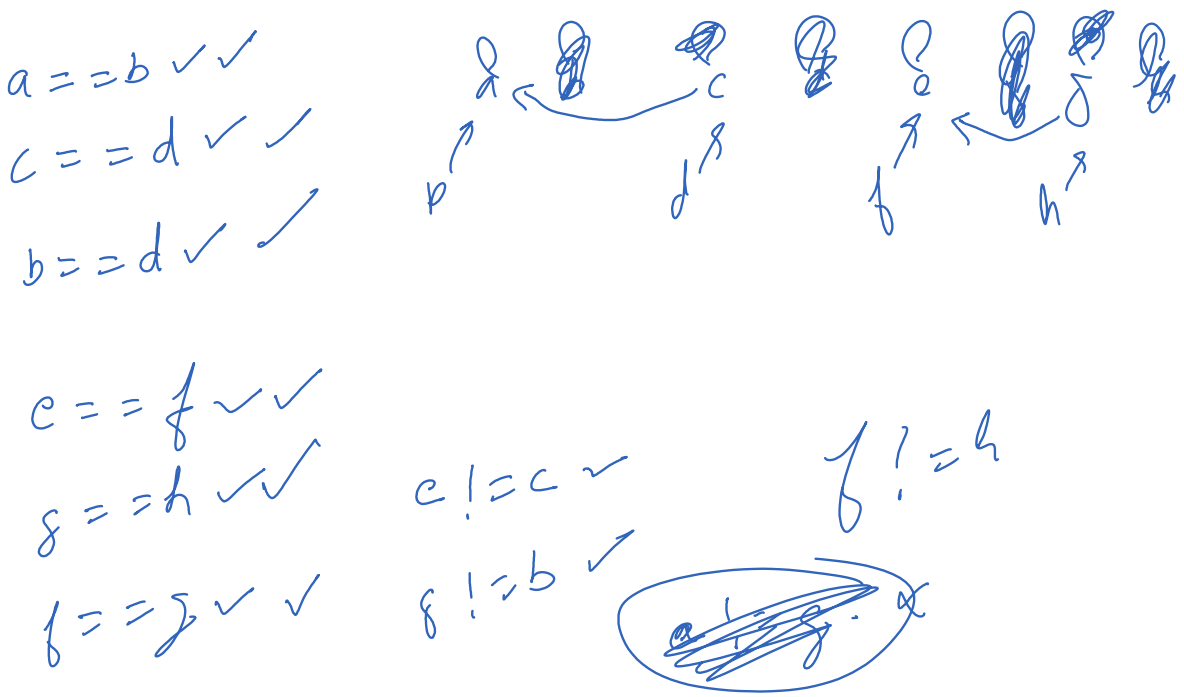
$n != s$ ✓

$q != d$ ✓

$p != s$ X

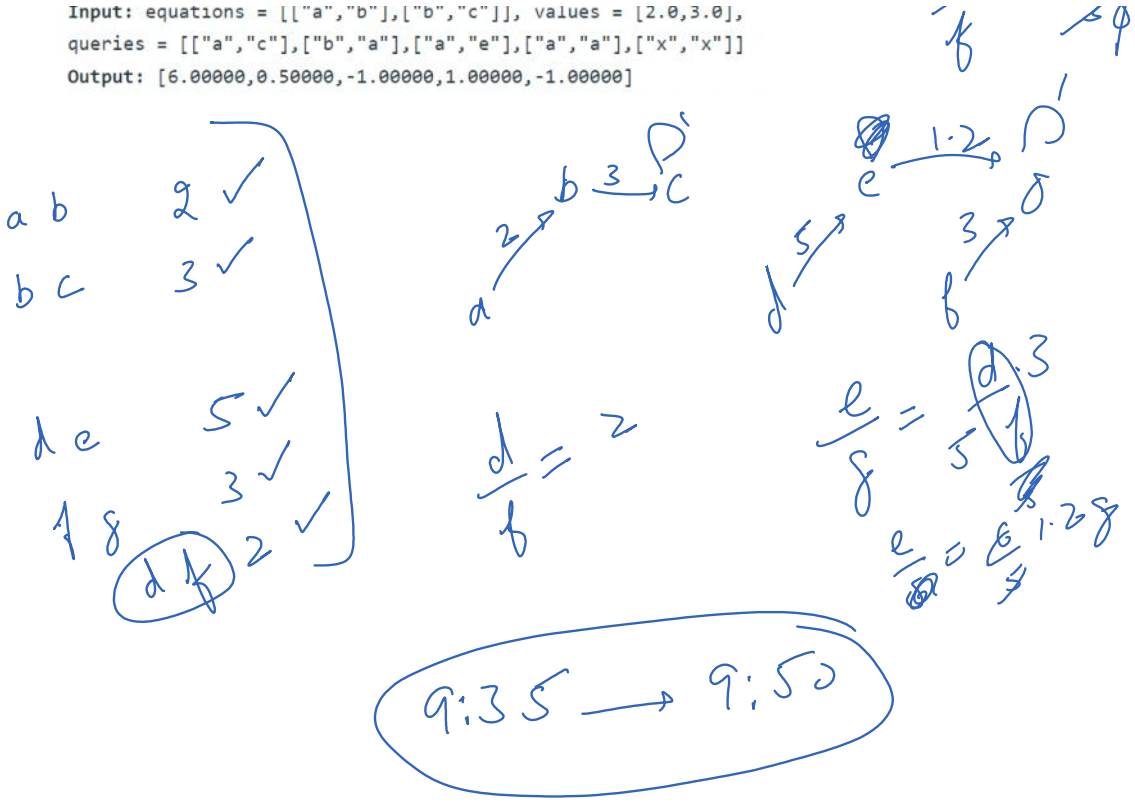


8:58 to 9:08

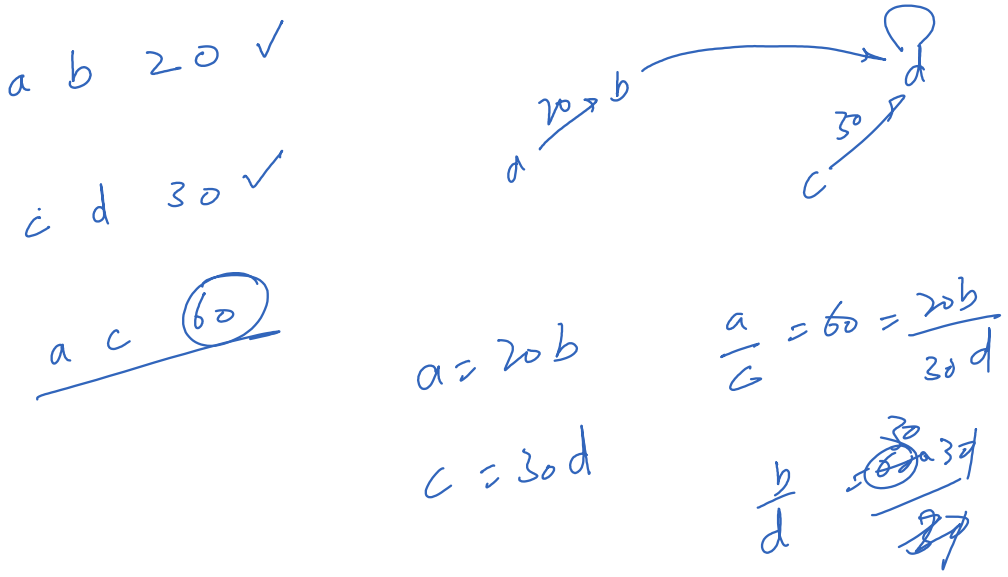


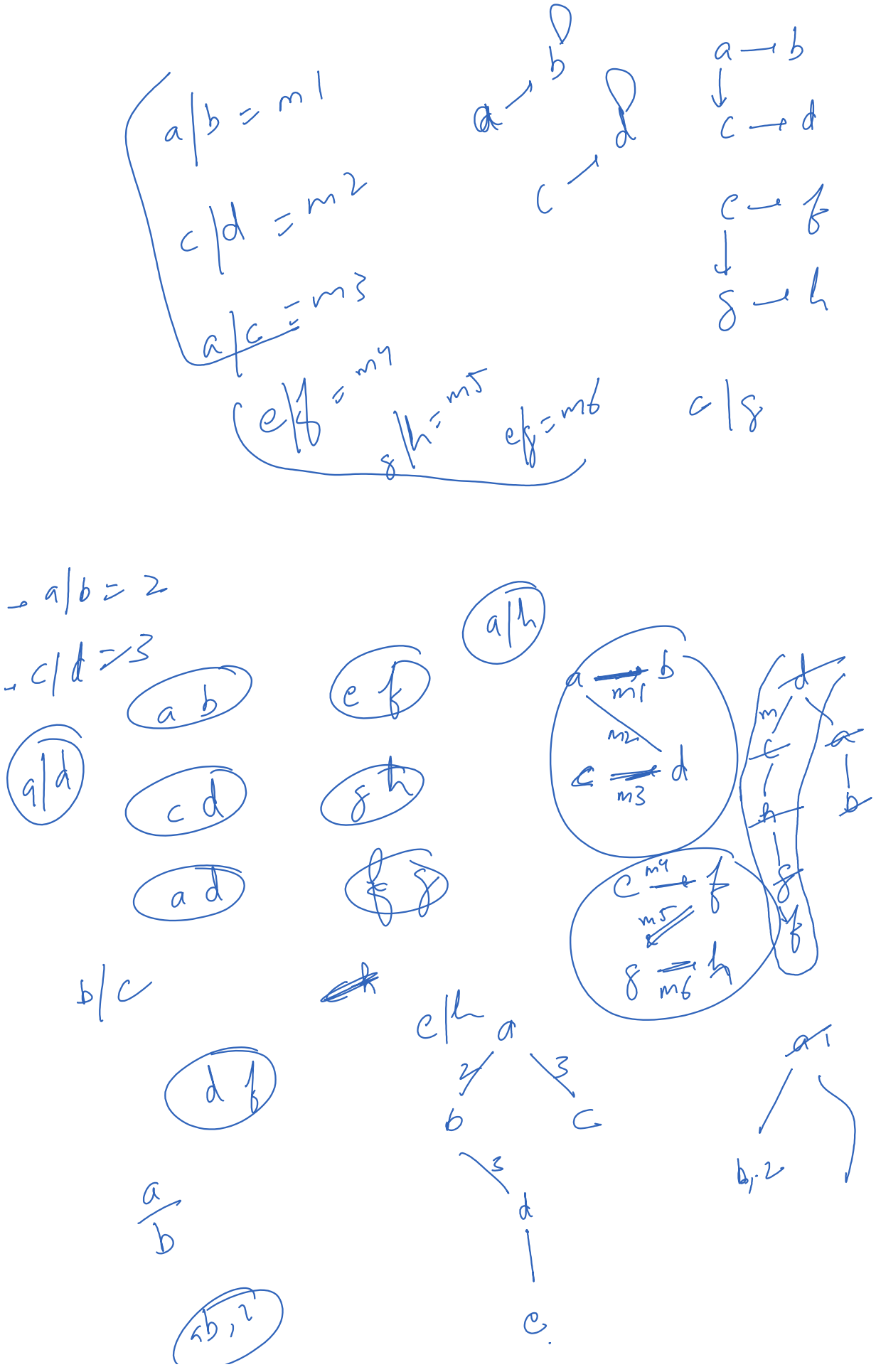
Input: equations = [["a","b"],["b","c"]], values = [2.0,3.0],
queries = [["a","c"],["b","a"],["a","e"],["a","a"],["x","x"]]
Output: [6.00000,0.50000,-1.00000,1.00000,-1.00000]

Input: equations = [["a","b"],["b","c"]], values = [2.0,3.0],
queries = [["a","c"],["b","a"],["a","e"],["a","a"],["x","x"]]
Output: [6.00000,0.50000,-1.00000,1.00000,-1.00000]

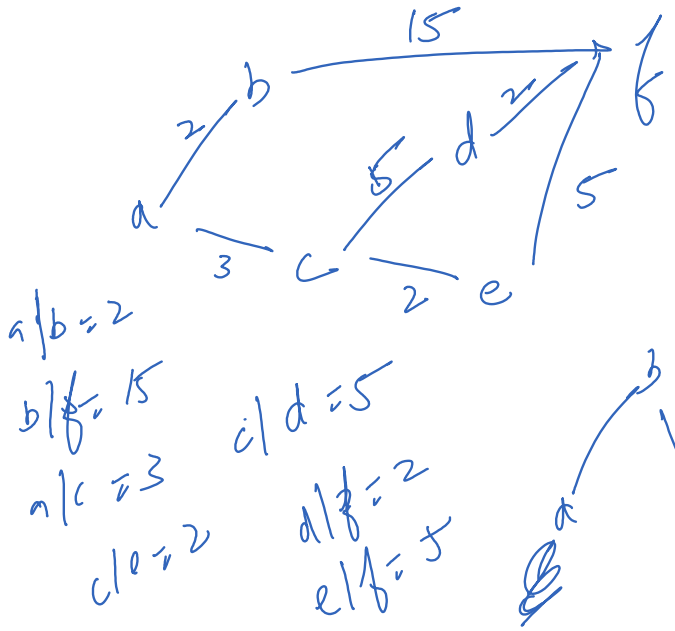


9:35 → 9:50

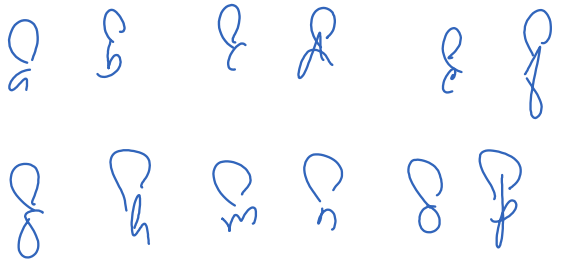


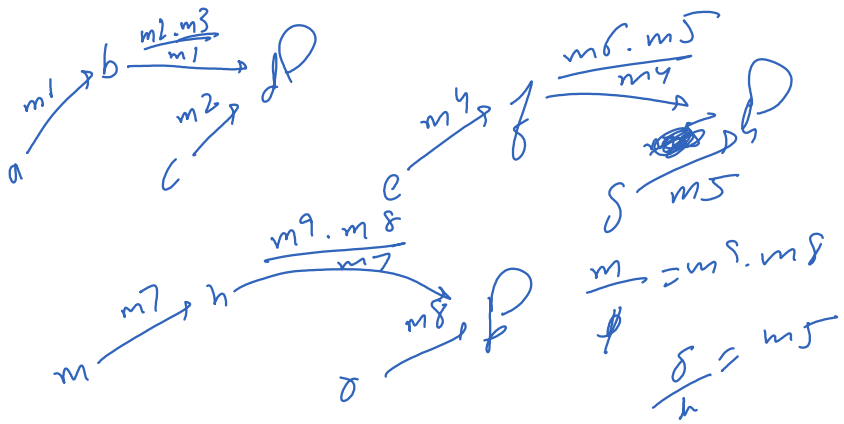

a/b = m1
c/d = m2
a/c = m3
e/f = m4
g/h = m5
ef = m6
c/g
a/h
a/d
b/c
c/h
ab, 2

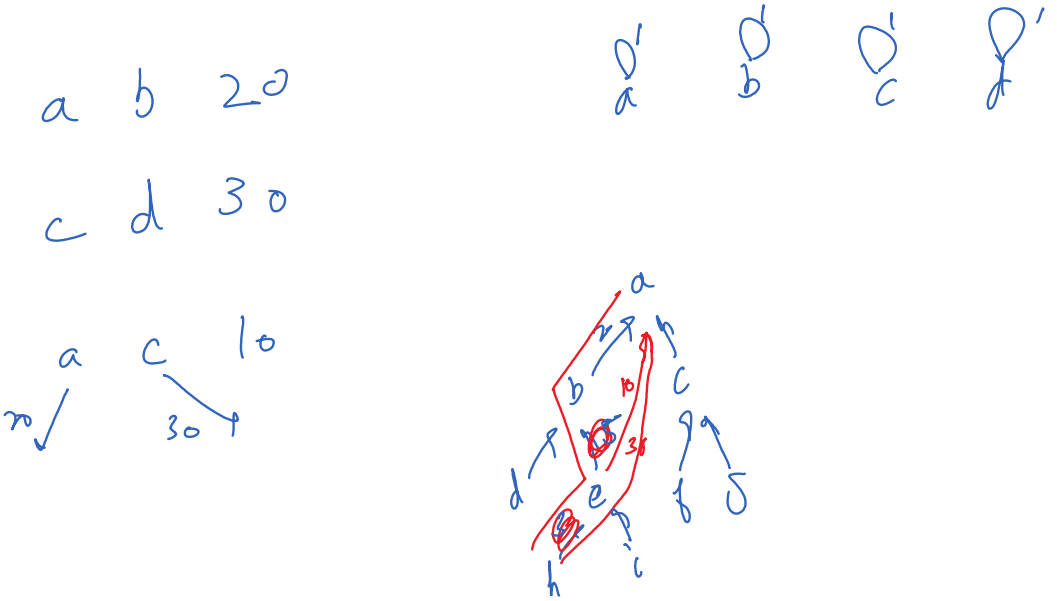
c.



1. a b ✓
2. c d ✓
3. a c ✓
4. e f ✓
5. g h ✓
6. e g ✓
7. m n ✓
8. o p ✓
9. m o ✓
10. m g



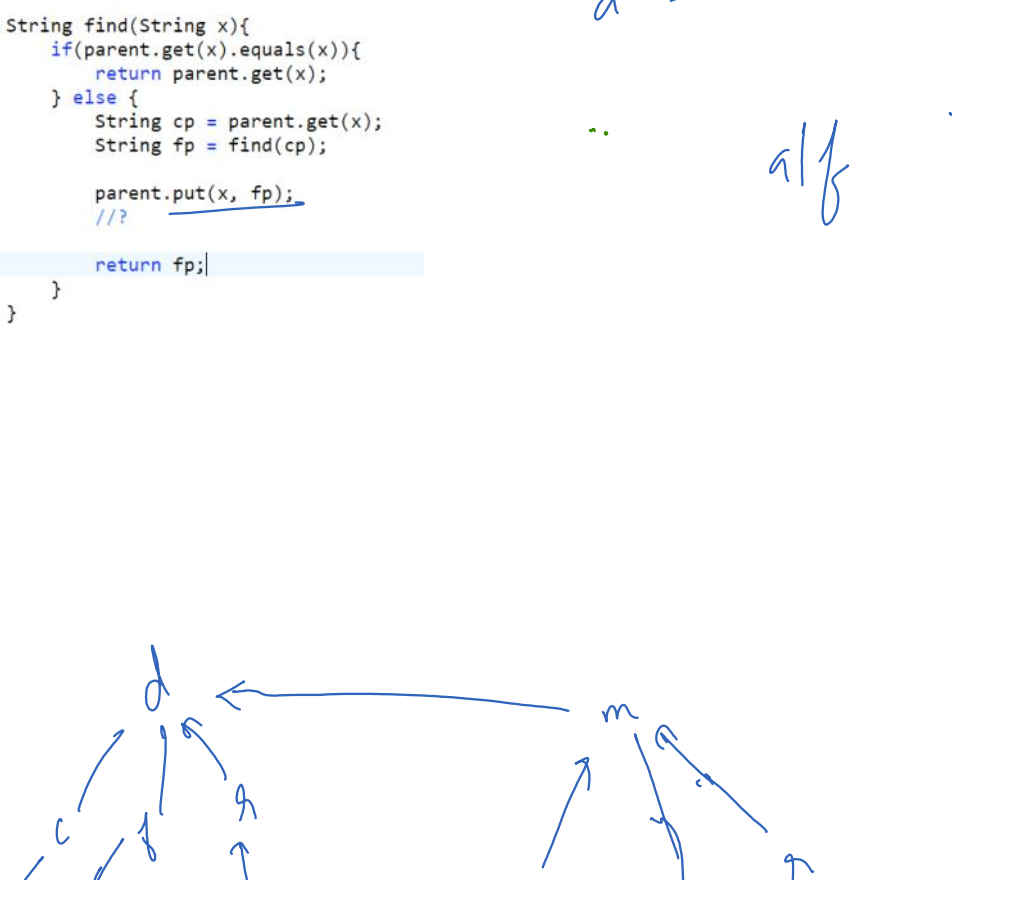


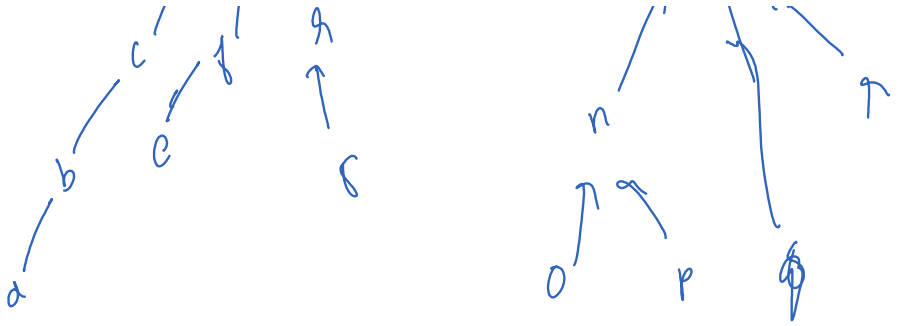


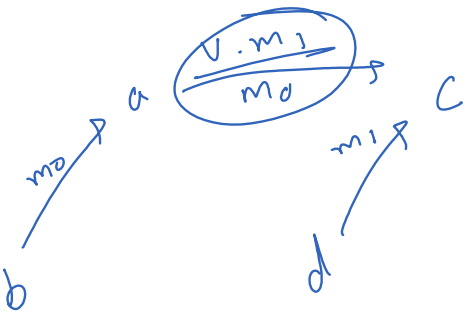
```
String find(String x){
    if(parent.get(x).equals(x)){
        return parent.get(x);
    } else {
        String cp = parent.get(x);
        String fp = find(cp);

        parent.put(x, fp);
        //?

        return fp;
    }
}
```



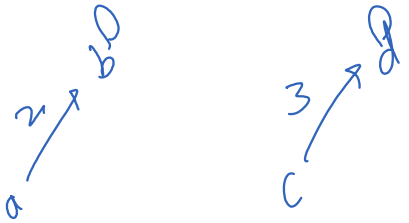




$$v = \frac{b}{d} = \frac{am_0}{cm_1} = v$$

$$\frac{a}{c} = \frac{v \cdot m_1}{m_0}$$

$$\frac{a}{b} = 2 \qquad \frac{c}{d} = 3$$



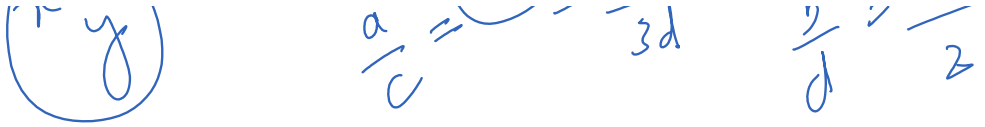
$b \to b \quad b+1$

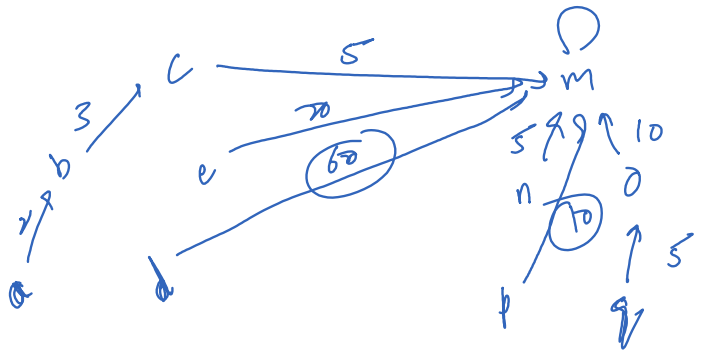
$a \to b \quad a+2$

$d \to d \quad d+1$

$c \to d \quad c+3$

$$\frac{a}{c} = \frac{5}{} = \frac{2b}{3d} \qquad \frac{b}{d} = \frac{3 \cdot 5}{2}$$



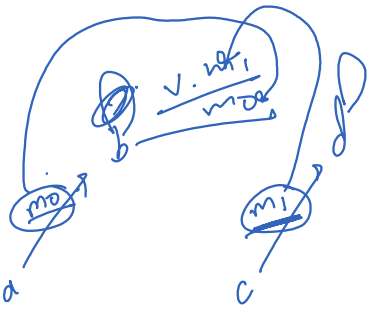


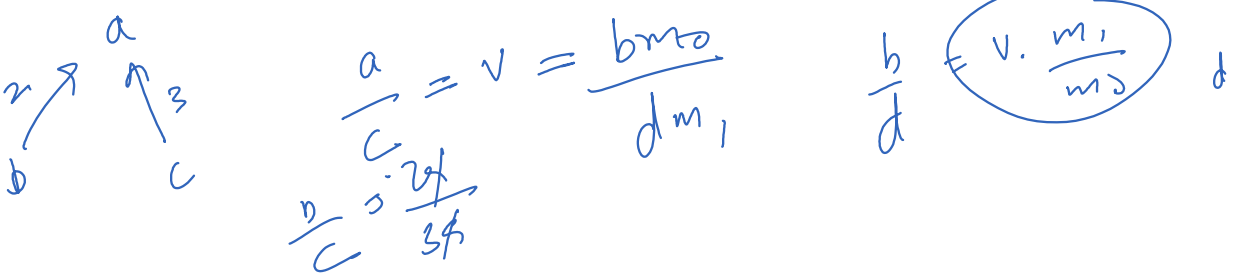
```
for(List<String> eqn: equations){
    String l0 = find(eqn.get(0));
    String l1 = find(eqn.get(1));

    double m0 = mult.get(eqn.get(0));
    double m1 = mult.get(eqn.get(1));

    parent.put(l0, l1);
    mult.put(l0, (values[i] * m1) / m0);

    i++;
}
```





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}
```